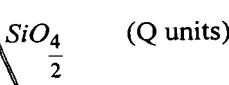
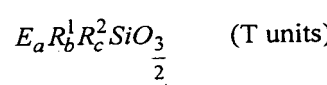
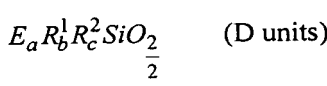
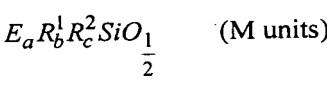


WHAT IS CLAIMED IS:

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1. A high weather and chemical resistant, addition-crosslinkable, epoxy-functional organopolysiloxane resin which contains at least one or more of the repeating units having the formulae:



wherein E is an epoxy-functional C₁₋₁₈ hydrocarbon group containing one or more oxygen atoms, provided that no oxygen atom is directly bonded to a Si- atom; and
R¹ and R² are independently a C₁₋₂₀ hydrocarbon, optionally interspersed with a heteroatom linking group;
a is an integer of 0, 1, or 2;
b is an integer of 0, 1, 2 or 3;
c is an integer of 0, 1, 2 or 3; and
in M units, a+b+c=3,
in D units, a+b+c=2,
in T units, a+b+c=1,

2 Sub A1
cont-

15 wherein the M units are present in less than about 40 mole percent;
16 the D units are present in an amount of up to about 40 mole percent;
17 and
18 the molecule, on average, contains at least two E components.

1 2. The resin of claim 1 wherein the hydrocarbon group of E
2 comprises a C₃₋₁₂ hydrocarbon group.

1 3. The resin of claim 1 wherein the epoxy-functional
2 organopolysiloxane resin has an alkoxy content of less than about 20 weight percent,
3 based on the weight of the epoxy-functional organopolysiloxane resin.

1 4. The resin of claim 1 wherein the epoxy-functional
2 organopolysiloxane resin has an epoxy equivalent weight in the range of about 150-
3 1000.

1 5. The resin of claim 2 wherein the epoxy-functional
2 organopolysiloxane resin has an epoxy equivalent weight in the range of about 200-
3 600.

1 6. The resin of claim 5 wherein the epoxy-functional
2 organopolysiloxane resin has a viscosity in the range of about 200-70,000 cps at
3 25°C.

1 7. The resin of claim 6 wherein the E is glycidoxypropyl



1 8. The resin of claim 6 wherein the epoxy-functional
2 organopolysiloxane resin comprises T units and the T units include structures

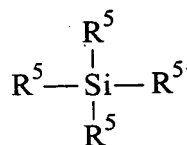
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cont.

3 selected from the group consisting of silsequioxane and polysilsesquioxane
4 structures.

1 9. The resin of claim 1 wherein the resin has a molecular weight
2 between about 750 and 25,000.

1 10. The resin of claim 1 wherein the epoxy-functional
2 organopolysiloxane resin is prepared by reacting a silicone resin with a silane having
3 at least one epoxy group per molecule.

1 11. The resin of claim 10 wherein the silane is represented by the
2 formula:



3 wherein each R^5 is individually selected from the group consisting of
4 alkyl (C_{1-12}), aryl (C_{6-9}), vinyl, glycol, alkoxy (C_{1-12}), and an epoxy functional C_{1-18}
5 hydrocarbon group of the formula $R^6 - E^1$ wherein E^1 comprises an epoxy group and
6 R^6 comprises a C_{1-18} hydrocarbon group optionally interspersed with at least one
7 heteroatom linking group, with the proviso that at least one R^5 comprises $R^6 - E^1$.

1 12. The resin of claim 11 wherein the heteroatom linking group,
2 if present, is not adjacent to the E^1 group.

1 13. The resin of claim 11 wherein the hydrocarbon group of the
2 R^6 comprises a C_{3-12} hydrocarbon group.

1 14. The resin of claim 11 wherein the silane has a molecular
2 weight in the range of about 100 to about 750.

Sub A!
cont.
1

2 15. The resin of claim 14 wherein the silane has an epoxy-
functionality in the range of about 1 to about 4.

1 16. The resin of claim 15 wherein the silane has an alkoxy
2 functionality in the range of about 1 to about 4.

1 17. The resin of claim 13 wherein R⁶-E¹ is glycidoxypropyl



1 18. The resin of claim 11 wherein the silane a γ -
2 glycidoxypropylsilane having C₁₋₁₂ alkoxygroups.

1 19. The resin of claim 10 wherein the silicone has a molecular
2 weight in the range of about 300 to about 15000.

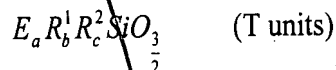
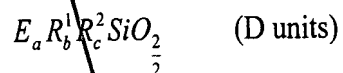
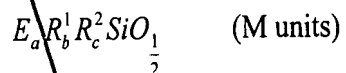
1 20. The resin of claim 7 wherein the resin comprises about 70
2 mole percent T units and about 30 mole percent D Units.

1 21. The resin of claim 1 wherein the resin is a liquid and has a
2 molecular weight of about 500-5,000.

1 22. The resin of claim 21 wherein the resin has a molecular weight
2 of about 1,200.

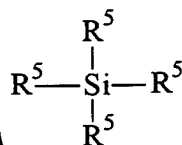
1 23. The resin of claim 22 wherein the molecule contains at least
2 three E components.

- 1 24. An epoxy-functional organopolysiloxane coating composition
2 comprising:
3 a hardener
4 an epoxy-functional organopolysiloxane resin which contains at least
5 one or more of the repeating units having the formulae:



- 6 wherein E is an epoxy-functional C_{1-18} hydrocarbon group containing one or
7 more oxygen atoms, provided that no oxygen atom is directly bonded
8 to a Si- atom; and
9 R^1 and R^2 are independently a C_{1-20} hydrocarbon, optionally
10 interspersed with a heteroatom linking group;
11 a is an integer of 0, 1, or 2;
12 b is an integer of 0, 1, 2 or 3;
13 c is an integer of 0, 1, 2 or 3; and
14 in M units, $a+b+c=3$,
15 in D units, $a+b+c=2$,
16 in T units, $a+b+c=1$,
17 wherein the M units are present in less than about 40 mole percent;
18 the D units are present in an amount of up to about 40 mole percent;

- 19 with the proviso that the molecule, on average, contains at least two
20 E components; and
21 an acrylic resin;
22 wherein the epoxy-functional organopolysiloxane resin is prepared by
23 reacting a silicone resin with a silane represented by the formula:

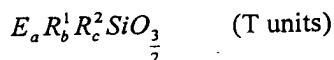
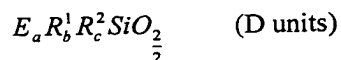
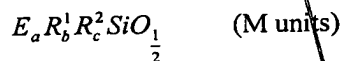


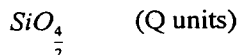
- 24 wherein R^5 are one of, or a combination of, the following groups alkyl (C_{1-12}), aryl
25 (C_{6-9}), vinyl, glycol, alkoxy (C_{1-12}), and an epoxy functional C_{1-18} hydrocarbon group
26 of the formula $R^6 - E^1$ wherein $R^6 - E^1$ comprises glycidoxypopyl



- 27 with the proviso that at least one R^5 comprises $R^6 - E^1$.

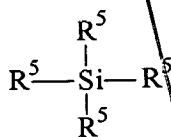
- 1 25. An epoxy-functional organopolysiloxane coating composition
2 comprising:
3 a hardener;
4 an epoxy-functional organopolysiloxane resin which contains at least
5 one or more of the repeating units having the formulae:



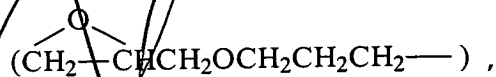


6 wherein E is an epoxy-functional C₁₋₁₈ hydrocarbon group containing one or
7 more oxygen atoms, provided that no oxygen atom is directly bonded
8 to a Si- atom; and
9 R¹ and R² are independently a C₁₋₂₀ hydrocarbon, optionally
10 interspersed with a heteroatom linking group;
11 a is an integer of 0, 1, or 2;
12 b is an integer of 0, 1, 2 or 3;
13 c is an integer of 0, 1, 2 or 3, preferably 0, 1, or 2; and
14 in M units, a + b + c = 3,
15 in D units, a + b + c = 2,
16 in T units, a + b + c = 1,

17 wherein the M units are present in less than about 40 mole percent;
18 the D units are present in an amount up to about 40 mole percent; and
19 with the proviso that the molecule, on average, contains at least two
20 E components; and
21 a flow additive;
22 wherein the epoxy-functional organopolysiloxane resin is prepared by
23 reacting a silicone resin with a silane represented by the formula:



- 24 wherein R^5 are one of, or a combination of, the following groups alkyl (C_{1-12}), aryl
25 (C_{6-9}), vinyl, glycol, alkoxy (C_{1-12}), and an epoxy functional C_{1-18} hydrocarbon group
26 of the formula $R^6 - E^1$ wherein $R^6 - E^1$ comprises glycidoxypropyl



- 27 with the proviso that at least one R^5 comprises $R^6 - E^1$.